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| EXAMINER | |
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| HISSONG, BRUCE D | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/574,046 | DICKEY ET AL. | |
| | Examiner | Art Unit | |
| | Bruce D. Hissong, Ph.D. | 1646 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-89* is/are pending in the application.

4a) Of the above claim(s) *1-29,35-43,58-70 and 85-89* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34,44-57 and 71-84* is/are rejected.

7)☒ Claim(s) *30-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/29/06, 3/9/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

***Election/Restrictions***

1. Applicant's election without traverse of Group II, claims 30-34, 44-57, and 71-84, and nucleic acids encoding the polypeptides of SEQ ID NO: 10 and SEQ ID NO: 5, in the reply filed on 3/9/09 is acknowledged.

2. Claims 1-89 are pending, with claims 1-29, 35-43, 58-70, and 85-89 withdrawn as non-elected subject matter. Claims 30-34, 44-57, and 71-84 are the subject of this office action.

***Information Disclosure Statement***

The information disclosure statements received on 3/29/06 and 3/9/09 have been fully considered.

***Claim Objections***

1. Claims 30-34 are objected to for depending from non-elected claims. Specifically, with the election, without traverse, of Group II, claims 1, 2, and 13 represent non-elected subject matter. Furthermore, it is noted that claims 1, 2, and 13 recite polypeptides other than the elected SEQ ID NOs 5 and 10, and if the limitations of claims 1, 2, and 13 are incorporated in their entirety into claims 30-32, these claims will recite non-elected subject matter.

2. It is noted that claims 48 and 75 recite non-elected subject matter. Specifically, with the election of SEQ ID NOs 5 and 10, the recitation of other SEQ ID NOs represents a recitation of non-elected subject matter. Although the claims are not presently objected to, Applicants are reminded that non-elected subject matter must be cancelled upon allowance.

3. The Examiner suggests amending claims 44 and 71 to recite "a biologically active carboxy-truncated interferon polypeptide" or something similar. It is not clear how a polypeptide could "contain", or even "comprise" a truncation. Similar amendments are suggested for claims 53, 57, 80, and 84, which also recite a polypeptide that "contains" a truncation.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 44-48 and 71-75 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are drawn to a polynucleotide encoding a polypeptide comprising biologically active interferon (IFN), or human α-2b-interferon (IFN-α-2b), wherein said IFN or IFN-α-2b contains a carboxy terminus truncation. As written, the claims encompass any naturally-occurring polynucleotides which encode carboxy-truncated IFN polypeptides, and therefore do not show the "hand of man" in the inventive process. It is suggested that this rejection can be overcome by amending the claims to recite “An isolated polynucleotide”.

***Claim Rejections - 35 USC § 112, first paragraph - enablement***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 44-46, 49-57, 71-73, and 76-84 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polynucleotides encoding IFN-α-2b polypeptides comprising carboxy truncations of 4-8 amino acids, as shown by SEQ ID NOs 6-10, does not reasonably provide enablement for polynucleotides encoding IFN or IFN-α-2b polypeptides comprising unlimited caroboxy truncation. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The claims of the instant invention are drawn to polynucleotides encoding carboxy-terminal truncated IFN polypeptides, and specifically, IFN-α-2b polypeptides. As written, the breadth of the claims is excessive because the claims merely require the IFN polypeptides to contain any carboxy terminus truncation. There is no limit on the number of amino acids which can be removed, and thus the claims read on IFN polypeptides with virtually unlimited deletion/truncation. The specification provides guidance and examples showing that the IFN-α-2b polypeptides of SEQ ID NOs 6-10 represent IFN-α-2b

with 4-8 amino acid truncations, respectively, and show that these truncated IFNs are biologically active. However, there is no guidance and examples showing any other IFN that has any other carboxy-terminal truncation and is still biologically active. A person of ordinary skill in the art would suspect that removal of 50-75% of the carboxy-terminal amino acids of IFN-α-2b would result in a polypeptide that does not possess IFN-α biological activity, and thus would not predict that all of the possible carboxy-truncated IFN polypeptides encompassed by the claims would be biologically active. Thus, a skilled artisan would require further, undue experimentation in order to make and use all possible polynucleotides encoding IFN polypeptides having unlimited carboxy-terminal truncations.

2. Claims 34, 51-52, 57, 78-79, and 84 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for isolated host cells such as isolated mammalian, bacterial, and yeast cells, as well as transformed plants, which may comprise an expression vector or cassette encoding a carboxy-truncated IFN polypeptide, does not reasonably provide enablement for all possible host cells which may comprise expression vectors or cassettes encoding carboxy-truncated IFN polypeptides. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The claims are drawn to host cells comprising an expression cassette or vector encoding a carboxy-truncated IFN polypeptide. As written, the claims read on isolated host cells such as bacterial cells, mammalian tissue culture cells, and plant cells. However, given the broadest reasonable interpretation, the claims can also be interpreted as reading on methods of gene therapy wherein a cell is within a living organism that has been transfected with an expression vector or cassette encoding a carboxy-truncated IFN polypeptide. Although the specification provides guidance and examples showing stable transformation of plants with said expression vectors or cassettes encoding carboxy-truncated IFN polypeptides, and expression in isolated mammalian tissue culture cells, yeast cells, and bacterial cells is well-known in the art, there is no guidance or examples showing how to express the claimed expression vectors or cassettes in an intact mammal, such as a human, for methods of gene therapy. Given the complexities and unpredictability of such methods of gene therapy, one of ordinary skill in the art would not be able to make and use the claimed host cells in a manner that is commensurate with the full scope of the claims without further, undue experimentation. It is suggested, however, that this rejection may be overcome by amending the claims to recite "An isolated host cell".

***Claim Rejections - 35 USC § 112, first paragraph – written description***

Claims 44-46, 49-57, 71-73, and 76-84 are rejected under 35 U.S.C. 112, first paragraph, containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to polynucleotides encoding IFN, or IFN-α-2b, polypeptides containing a carboxy terminal truncation. Although the claims require the encoded IFN polypeptides to be "biologically active" the claims do not require the encoded IFN polypeptides to have any specific activity, or even a known IFN-α activity such as antiviral activity. Furthermore, the claims do not require any particular structure other than the claimed polynucleotides must encode an IFN polypeptide with any carboxy terminal truncation. The specification teaches IFN-α-2b polypeptides truncated by 4-8 amino acids, as represented by SEQ ID NOs 6-10. However, the specification does not describe any other IFN polypeptide, or specifically any IFN-α-2b, that has been carboxy-truncated and is biologically active. Similarly, the specification does not describe which amino acids, other than amino acids 4-8, can be deleted from an IFN polypeptide and produce a polypeptide that is biologically active. Because the specification has not described such carboxy-truncated IFN polypeptides, a person of ordinary skill in the art would recognize that the polynucleotides encoding these polypeptides have not been described either. Therefore, the claims are drawn to a genus polynucleotides encoding truncated IFN polypeptides which has not been adequately described.

To provide adequate written description and evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, or any combination thereof. In this case, the only factor present in the claims is a requirement that the claimed polynucleotides encode any IFN polypeptide, and specifically any IFN-a-2b polypeptide, that has any number of amino acids truncated from the carboxy terminus. There is no identification of any particular amino acid residues/regions in the carboxy terminus that must be conserved in order to remain "biologically active". Accordingly, in the absence of sufficient distinguishing characteristics, the specification does not provide adequate written description of the claimed genus of polynucleotides encoding the recited carboxy-truncated IFN polypeptides.

***Claim Rejections - 35 USC § 112, second paragraph***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 53 and 80 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step(s) is: a step that requires the plants to be transformed under conditions suitable for production of the polypeptide".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 44-46, 49-52, 57 are rejected under 35 U.S.C. 102(e) as being anticipated by Welcher *et al* ("Welcher" – US 20050221344).

The claims are drawn to a polynucleotide encoding a polypeptide comprising a biologically active interferon, wherein said interferon contains a carboxy terminus truncation. The claims also recite nucleic acids encoding carboxy-truncated IFN and further encoding the amino acid sequence of a signal peptide, and wherein the signal peptide is operably linked to the 5' end of a nucleotide sequence encoding said biologically active IFN. Also claimed are expression cassettes or vectors/plasmids comprising a polynucleotide encoding a carboxy-truncated IFN, host cells comprising said vector or expression cassette, and a method for producing a polypeptide comprising a biologically active IFN.

Welcher teaches IFN polypeptides which may be truncated at the carboxy terminus, and nucleic acids encoding such carboxy-terminated IFN polypeptides (paragraph 0073 and claim 3). Welcher also teaches truncated IFN polypeptides with leader or signal peptides (paragraphs 0175, 0177) and nucleic

acids encoding IFN polypeptides with a signal peptide (paragraph 0359), wherein the nucleic acid sequence encoding said signal peptide is positioned at the 5' end of the IFN encoding region. Welcher further discloses nucleic acids encoding truncated IFN with a vector (claim 4) and both prokaryotic and eukaryotic host cells comprising said vector (claims 5-7). Regarding host cells, Welcher teaches that appropriate host cells include bacterial (*E. coli* - paragraph 0188) and numerous mammalian cells (paragraph 0189), as well as plants (paragraphs 0193, 0213). Welcher also claims a process for preparing IFN polypeptides comprising culturing a host cell comprising a vector encoding an IFN polypeptide and isolating said polypeptide from the culture (claim 9).

2. Claims 44, 49-52, 57, 71, 76-79, and 84 are rejected under 35 U.S.C. 102(b) as being anticipated by Franke *et al* ("Franke" – *DNA*, 1982, Vol. 1, p. 223-230, cited in the IDS received on 3/29/06).

The subject mater of claims 44, 49-52, and 57 is discussed above. Claims 71, 76-79, and 84 recite subject matter that is similar to claims 44, 49-52, and 57, wherein the encoded carboxy-truncated IFN is IFN-α-2b.

Franke teaches a nucleic acid encoding a carboxy-truncated IFN-α polypeptide that is lacking the 11 carboxyterminal amino acids (see p. 227, 1st column, 1st full paragraph). Fig. 4 of Franke teaches that the resulting polypeptide, "A-11" is 154 amino acids, which combined with the missing 11 amino acids, would indicate that the parent polypeptide was 165 amino acids. It is known in the art that all IFN-α polypeptides are 166 amino acids, with the exception being IFN-α2, which is 165 amino acids (see page 28, 2nd paragraph of Cheetham *et al*, Antiviral Res., 1991, Vol. 15, p. 27-40, cited in the IDS received on 3/29/06). Thus, while Franke does not explicitly state that the carboxy-truncated "A-11" polypeptide is a truncated IFN-α-2b polypeptide, because the parent polypeptide appears to be 165 amino acids it would be apparent, in absence of evidence to the contrary, that the encoded polypeptide of Franke is equivalent to IFN-α-2b. Franke teaches construction of plasmids for expressing nucleotides encoding IFN polypeptides (p. 224, 1st column and p. 226, 1st column), and expression of these IFN-encoding plasmids in *E. coli* (p. 224, 2nd column, 1st full paragraph), resulting in production of a carboxy-truncated IFN-α-2b with biological activity (see Table 1). Finally, it is noted that Cheetham *et al* also teaches carboxy-truncated IFN polypeptides (see p. 32), it is not being used here in a grounds of rejection, but to point out what was known in the art regarding IFN-α2.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Welcher *et al* or Franke *et al*, each in view of Brandle *et al* ("Brandle" – US 20030135887).

The subject matter of the presently claimed invention is discussed above. Claims 53-56are further drawn to method for producing a biologically active carboxy-truncated IFN polypeptide by transforming a plant with an expression cassette or vector comprising a nucleic acid which encodes said carboxy-truncated IFN.

As set forth previously, Welcher discloses nucleic acids encoding carboxy-truncated IFN polypeptides, wherein these carboxy-truncated polypeptides may comprise a signal peptide sequence. Welcher also teaches expression of truncated IFN polypeptides in various host cells, including plants. Welcher does not specifically teach methods of transforming a plant with a vector encoding carboxy-truncated IFN polypeptides.

Franke discloses nucleic acids encoding carboxy-truncated polypeptides equivalent to IFN-α-2b, vectors/plasmids encoding said carboxy-truncated IFN-α-2b, and expression in E. coli, but does not teach expression in plants or methods of expressing IFN polypeptides in plants.

However, Brandle teaches the use of plants to express various polypeptides, including cytokines such as IL-4 and IL-10, and also interferons (see abstract). Specifically, Brandle teaches that expression of polypeptides in plants has numerous advantages, including high production yields at low cost, reduced health risks from pathogen contamination, and correct modification and assembly of foreign proteins (see paragraphs 0007-0009). Brandle also teaches vectors and methods for stably expressing human proteins, including the cytokines IL-4 and IL-10, in plants such as tobacco (see Examples 1-2 for expression of biologically active IL-4 and Example 3 for expression of biologically active IL-10).

Therefore, a person of ordinary skill in the art, at the time the instant invention was conceived, would have been motivated to transform and express nucleic acids encoding carboxy-truncated IFN in a plant host, and subsequently isolate/recover said IFN from the host plant. The motivation to do so comes from Welcher and Franke, which teach nucleic acids encoding carboxy-truncated IFN polypeptides that

are biologically active. Further motivation is provided by Welcher because it teaches that carboxy-truncated IFN polypeptides can be produced by expression of in plants, and Brandle, which discloses advantages of protein expression in plants as well as vectors and methods for such expression.

Therefore, because Welcher and Franke each teach biologically-active carboxy-truncated IFN polypetpides and Welcher also teaches that carboxy-truncated IFN polypeptides can be produced by expression of in plants, while Brandle further teaches the advantages of protein expression in plants as well as vectors and methods for such expression, a person of ordinary skill in the art would thus be motivated to expression the nucleic acids encoding the carboxy-truncated IFN of either Welcher or Franke in the plants disclosed in Brandle using methods taught by Brandle. By following the combined teachings of these references, a person of ordinary skill in the art would know that biologically active carboxy-truncated IFN polypeptides, taught by Welcher and Franke, could be effectively produced by transformation in plants by using vectors/expression systems, taught by Brandle, to express nucleic acids encoding said truncated IFN polypeptides.

2. Claims 72-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Franke *et al* in view of Welcher *et al*.

The subject matter of the claims of the instant invention is discussed above. Claims 72-73 are drawn to nucleic acids encoding carboxy-truncated IFN-α-2b, wherein said nucleotides encode a signal peptide linked to the carboxy-terminal truncated IFN-α-2b.

As discussed above, Franke discloses nucleic acids and vectors/cassets encoding an IFN-a-2b polypeptide. Franke is silent regarding a nucleic acid which encodes the carboxy-truncated IFN with a signal peptides. However, Welcher discloses truncated IFN polypeptides with signal sequences, as well as nucleic acids encoding said polypeptides. Because Welcher teaches the use of signal peptides for efficient expression of IFN polypeptides, a person of ordinary skill in the art would have the motivation to incorporate a nucleic acid encoding a signal peptide into nucleic acid encoding carboxy-truncated IFN-α-2b, and furthermore, place the signal peptide-encoding sequence at the 5' end of the sequence encoding IFN-α-2b (see Welcher, paragraph 0175).

3. Claims 80-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Franke *et al*, in view of Welcher *et al*, and further in view of Brandle *et al*.

The subject matter of the instant invention is discussed above. Claims 80-83 are further drawn to methods of producing an IFN-α-2b polypeptide by transforming a plant with a vector or cassette encoding

said carboxy-truncated IFN-α-2b, wherein the nucleic acid encoding the carboxy-truncated IFN-a-2b further encodes a signal peptide.

The subject matter of Franke, Welcher, and Brandle is discussed above. Franke is silent regarding the use of plants or plant cells to express carboxy-truncated IFN-α-2b polypeptide. However, Welcher teaches that plants can be used as host cells for carboxy-truncated encoding nucleic acids molecuels, and Brandle also teaches stable transformation of plants with nucleic acids encoding human proteins, including intmolecules, and also provides guidance, examples, and methods of such stable transformation.

Therefore, one of ordinary skill in the art, at the time the instant invention was conceived, would have been motivated to express the nucleic acids of Franke in plants because Welcher suggests plants as good hosts for expression of IFN polypeptides, and furthermore, because Brandle provides guidance and teachings of stable transformation of plants cells with nucleic acids encoding other cytokines. Furthermore, because Welcher teaches the incorporation of a signal peptide coding sequence into nucleic acids encoding carboxy-truncated IFNs, a person of ordinary skill in the art would be motivated to incorporate a sequence that encodes a signal peptide into the nucleic acids of Franke which encode a carboxy-truncated IFN-α-2b polypeptide.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 53-57 and 80-84 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7-8, 12, and 14-17 of U.S. Patent No. 6,815,184. Although the conflicting claims are not identical, they are not patentably distinct from each other.

The subject matter of the presently claimed invention is discussed above. Claims 53-57 and 80-84 are drawn to methods of preparing a polypeptide comprising biologically-active IFN, or IFN-α-2b, comprising transforming a plant with an expression vector or cassette encoding a biologically active IFN, or IFN-*a*-2b. The claims are further drawn to methods of recovering said polypeptides, and methods wherein said expression cassette or vector are stably incorporated into the genome of the plant.

The '184 patent claims methods of producing biologically active IFN-α-2b polypeptides in duckweed plants, wherein said methods comprise culturing duckweed plants which have been stably transformed with a nucleic acid encoding a biologically active IFN-α-2b polypeptide. Also encompassed is stable transformation of duckweed plants with nucleic acids encoding IFN-α-2b which has been modified for enhanced expression in duckweed and/or having duckweed-preferred codons, and wherein said nucleic acids also encode a signal peptide sequence such as the IFN-α-2b signal peptide sequence or the rice amylase signal peptide.

A person of ordinary skill in the art would recognize that the presently-claimed subject matter is an obvious variation of the claims of the '184 patent. Although the '184 patent does not explicitly claim methods of producing carboxy-truncated IFN polypeptides, it is noted that both the present claims and those of the '184 patent are drawn to methods of producing biologically-active IFN polypeptides, and in the absence of evidence to the contrary, the biologically active IFN polypeptides of the'184 patent would encompass the biologically active IFN polypeptides of the present invention. Furthermore, both the '184 patent and the instant application teach stable transformation of nucleic acids encoding biologically active IFN polypeptides in duckweed plants, wherein the nucleic acids are optimized for duckweed or contain duckweed codons (see instant specification, p. 10), and wherein the nucleic acids also encode a signal peptide, such as the IFN-α-2b signal peptide or the rice amylase signal peptide (see p. 17 of the instant specification). Therefore, because both the '184 patent and the instant application both claim methods of expression biologically active IFN polypeptides by stably transforming plants, such as duckweed, with a nucleic acid encoding biologically active IFN polypeptides and further encoding various signal peptides, wherein said nucleic acids have been optimized for duckweed expression or with duckweed codons, a person of ordinary skill in the art would conclude that that the instant application is an obvious variant of the '184 patent.

***Conclusion***

Claims 34, 44-57, and 71-84 are rejected.

Claims 30-33 are objected to but would be allowable if written in independent form to incorporate the limitations of claims 1, 2, or 13.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce D. Hissong, Ph.D. whose telephone number is (571)272-3324. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Nickol, Ph.D. can be reached on (571) 272-0835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bruce D. Hissong
Art Unit 1646

/Robert Landsman/
Primary Examiner, Art Unit 1647